

# Prevalence of Malaria Parasites Amongst Pregnant Women in Calabar Cross River State Nigeria

**Bernice Udoh\***

University of Calabar, Calabar, Nigeria

**Aniekan Peter**

University of Uyo, Uyo, Nigeria

**Sony-Shakins Umotong**

University of Uyo Teaching Hospital, Uyo, Nigeria

**A. Alaribe**

University of Calabar, Calabar, Nigeria

## Abstract

Malaria infection during pregnancy is a major public health problem- especially in tropical and sub-tropical regions; with substantial risks for the mother, her foetus and the new-born, Pregnant women are particularly susceptible to malaria, and in low transmission settings they have a greater risk of severe Plasmodium falciparum malaria. This study aimed at investigating the rate of parasitaemia amongst pregnant and none pregnant women was conducted among people attending clinics at the University of Calabar Teaching Hospital, Mambo hospital, Nosam medical laboratory services in Calabar Cross River state. They fall within the age group 18 to 60 years. They were pregnant women who came for Antenatal clinic, controls were sampled from patients who came to request for medical examination and blood donors. Thick and thin blood smears were made from finger prick samples of 400 candidates attending Antenatal clinics 200 of them were from established pregnant women and the other 200 were from non-pregnant women to serve as control. The blood films were dried and fixed in absolute methanol dried and stained with 2% Giemsa stain for 30 min. it was then rinse in clean water and allowed to dry in a draining rack. Dried slides were viewed using x100 oil immersion objective. Result revealed a parasitic rate of 132 (55.9 %) among pregnant women and 104 (44.1%) parasitaemia among none pregnant women. The difference between pregnant women and none pregnant women were significantly different at  $p < 0.05$ . Similarly, the mean parasite density of the pregnant women was higher 28.9 against 14.2 of control none pregnant women. In conclusion there was a significant density of malaria parasitaemia amongst pregnant women in this study.

**Keywords:** Malaria; Parasitaemia; Pregnancy; Blood films.



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## 1. Introduction

Malaria is a major public health problems in Nigeria and indeed many parts of sub-saharan Africa. Both infections kill millions of people each year with disproportionate heavy burden on Africa, India, Southeast Asia and South America [1, 2].

Sub-Saharan Africa accounts for 90% of the estimated 212 million cases of malaria that causes over 429 000 deaths annually [3]. Malaria is a major cause of maternal anemia, which in turn is a risk factor for maternal mortality resulting in about 35% of preventable cases of low birth weight [4]. Given this magnitude of disease burden, estimating the economic burden of malaria is necessary to provide a basis or platform for advocacy with Ministries of Finance and donors for increased investments in addressing public health problems such as malaria [5]. Data on the economic burden of malaria provide essential information on the magnitude of the problem. They complement disease burden data and can be used to show who bears the economic burden of malaria. Studies have shown that although there are equal exposure and incidence of malaria across the socio-economic groups [6], In Nigeria, malaria has been shown to account for over 40% of the total monthly curative healthcare costs incurred by households compared to a combination of other illnesses; the cost of treating malaria and other illnesses depleted 7.03% of the monthly average household income, and treatment of malaria cases alone contributed 2.91% of these costs [7].

## 2. Methods

### 2.1. Study Site

The study was carried out in Calabar which is the capital of Cross River state lies within the tropical rain forest belt which favours the breeding of vectors of parasitic diseases. It has a latitude of 4° S and 8° N, and the temperature ranges between 25.9 to 34.7 °C. The city has an annual rainfall of about 265mm and relative humidity

range of 77-91. Calabar is highly populated with Efiks , Ibibios Anangs, Ibos and some minor tribes from Northern Cross River state.

## 2.2. Study Setting

This study was conducted among people attending clinics at the University of Calabar Teaching Hospital, Mambo hospital, Nosam medical laboratory services and other private laboratories. They fall within the age group 18 to 60 years. They were pregnant women who came for Antenatal clinic, controls were sampled from patients who came to request for medical examination and blood donors.

## 2.3. Collection and Processing of Samples

Thick and thin blood smears were made from finger prick samples of 400 candidates attending Antenatal clinics 200 of them were from established pregnant women and the other 200 were from non-pregnant women to serve as control. The blood films were air dried and fixed in absolute methanol dried and stained with 2% Giemsa stain for 30 min. it was then rinse in clean water and allowed to dry in a draining rack. Dried slides were viewed using x100 oil immersion objective.

## 2.4. Quantitative Parasite Count

The thick film was used for the quantitative parasite count. The number of parasite present in the slide were enumerated as described by Shute 1998 as follows

$$\text{Number of parasites per ul of blood} = \frac{\text{Number of parasite seen}}{1000 \text{ leucocytes}} \times 8000$$

## 3. Results

Prevalence of MP among pregnant women samples showed a parasitic rate of 132 (66 %) and 104 (52%) parasitaemia among none pregnant women. The difference between pregnant women and HIV samples were significantly different at  $p < 0.05$ . Similarly, the mean parasite density of the pregnant women was higher 28.9 against 14.2 of control none pregnant women.

**Table-1.** Prevalence of Malaria Parasite Among Pregnant Women and Non-pregnant Women

Age Limit	Pregnant-Women With Parasite Load %	Non-Pregnant Women With Parasite Load %
18-27	35 (26.5)	43 (41.3)
28-37	82 (62.1)	54 (51.9)
38-47	15 (11.4)	7 (0.06)
parasitaemia	132 (66)	104 (52)
No parasitaemia	68 (34)	96 (46)
Malaria parasite density	28.9	14.2
Comparing with Total parasitaemia	132 (55.9)	104 (44.1)

## 4. Discussion

Malaria in pregnancy is associated with maternal mortality and anaemia, low birth weight (LBW), stillbirth and severe anaemia of the new born. In high transmission settings mothers are usually asymptomatic but in primigravidae, birthweight is reduced [8], In malaria endemic regions, individuals are constantly exposed to malaria parasites through bites of the mosquitoes. This frequent exposure leads to the development of an effective anti-disease immunity, which prevents life-threatening parasite burdens and suppresses the pro-inflammatory responses that cause illness [9]. Malaria infection during pregnancy is a major public health problem- especially in tropical and sub-tropical regions; with substantial risks for the mother, her foetus and the new-born [2, 10]. Most cases of malaria in pregnancy in areas of stable malaria transmission are asymptomatic [11]. Depending on the endemicity of malaria in an area, it can be expected that 1–50% of pregnant women may carry malaria parasitaemia, especially in the placenta, without noticing it *Steketee, et al.* [12] [2]. This is attributed to anti-disease immunity acquired during previous exposure that protects against clinical malaria [13]. Pregnant women are three times more likely to suffer from severe diseases as a result of malarial infection compared with their non-pregnant counterparts, and have a mortality rate that approaches 50% [10]. In our study malaria parasitaemia was higher in the young age group 18-27 and 28-37 than the adult age group. 38-47. This may be because of low socioeconomic status of this age group. They are more venerable to malnutrition and sleeping in areas that makes them venerable to mosquito bites.

Specific population at risk of malaria infection include: young children, pregnant people: with HIV/AIDS, international travellers from non -endemic areas (because they lack immunity). And immigrants from endemic areas and their children living in non-endemic areas and returning to their home countries [14]. In our study the pregnant women were more venerable than non-pregnant women. The World Health Organization (WHO) now recommends that all women in the second or third trimester of pregnancy who have uncomplicated *P. falciparum* malaria should be treated with artemisinin-based combination therapy.

In conclusion there was a significant density of malaria parasitaemia amongst pregnant women in this study.

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